

SUBTERRANEA BRITANNICA

Bulletin No. 14

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Officers:

A. G. Rawcliffe, M.A., Chairman - 15 Woodland Way, Stevenage, Herts.
(Tel: Stevenage 54041).

Eleanor Clark, Honorary Treasurer - 46 Sun Hill, Royston, Herts.
(Tel: Royston 42079).

Sylvia P. Beamon, M.A., Publication Secretary and Representative on the
General Council of the Societe Francaise D'Etude des Souterrains -
16 Honeyway, Royston, Herts. SG8 7ES (Tel: Royston 42120).

Committee Members: Tom Doig, Alan MacCormick, Frank Morgan, Anne Smith,
Graham Thrussell - Young Person's representative, Margaret Walker.

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Bulletin compiled by Sylvia P. Beamon.

EDITORIAL

Mr. John Scott had prepared his lecture on Underground Photography for the January Conference Day and was looking forward to the occasion, but regrettably he died a week beforehand. The following obituary appeared in the Cambridge Evening News (28/1/81) which carries the Society's sentiments:

"I write to express the sadness of the archaeologists in Cambridgeshire at the premature death of Mr. John Scott.

John Scott, an engineer, was a talented photographer who had devoted much of his spare time over the last 17 years to recording archaeological excavations and sites in the county. He had trained himself for this demanding work, and at the time of his death was one of the best archaeological site photographers in England. Much of his work was on remains which have since been destroyed, and he leaves behind him a permanent memorial in the folios of photographs and colour transparencies he has taken.

He will be much missed by his family and friends and I should like to take this opportunity to pay tribute to his memory."

JOHN ALEXANDER,
Chairman, Cambridgeshire
Archaeological Committee.

WINTER CONFERENCE

A higher number than usual enjoyed the one day conference which was held at "Strathaird", Lucy Cavendish College, Cambridge on the 31st January, 1981.

The Canterbury Medieval Drain or the Great Drain was the subject of Michael Jack's illustrated, stimulating and explanatory talk on the activities of three members of Subterranea Britannica who took part in this survey. He kept us amused with anecdotes of the appalling conditions and of their 'popping-up' out of various man-holes in the most surprising of places. (A report appeared in Subterranea Britannica Bulletin No. 13. pp. 16 - 18.)

Harry Pearman of the Chelsea Speleological Society continued the morning's proceedings by showing slides and discussing a Dartford chalk mine.

Miss G. B. Moncur's lecture on the Eastry Warren of Passages, Kent showed that they were originally excavated for chalk and were then subsequently used for smuggling. Later they were extended as a 'Folly' by the then owner Mr. H. Foord. From time to time various dubious parties were also held there and a more recent activity has been its use as a rifle range. Sylvia Beamon showed slides of this site which were taken last year when the Eastry Tunnels were the venue for the Society's Spring Outing.

Finally, Sylvia Beamon, in the untimely absence of Mr. Scott, gave a report illustrated with slides of the search for the Anstey Castle Tunnel by the Hatfield Sub-aqua Club, the Bristol Exploration Club and Subterranea Britannica.

SYLVIA P. BEAMON.

EXPLORATION OF UNDERGROUND STRUCTURES AND BAT CONSERVATION

All members should be aware, if they intend exploring any underground structures whether ice-houses, wells, mines, or canal or railway tunnels, that certain of our native species of bats, including two which are protected under the Conservation of Wild Creatures and Wild Plants Act, 1975, hibernate in such places during the months October - March.

Disturbance and arousal of these cavernicolous hibernating bats can lead to depletion of vital fat reserves and consequent failure to survive the winter. Smaller sites known or strongly suspected to be used by bats in winter should not be visited during the period October - March, except by, possibly, acknowledged bat specialists once or twice for recording purposes. Even in larger underground sites, visits during the 'close period' should be restricted if at all possible, and every effort should be made to reduce any form of disturbance of any bats to an absolute minimum - changes in the ventilation of the system, noise, general disturbance, bright lights and attempts at photography should all be avoided.

A leaflet 'Focus on Bats' issued by the Society for the Promotion of Nature Conservation is available on request by sending a SAE to P. W. Sowan, Subterranea Britannica, 96a Brighton Road, South Croydon, Surrey CR2 6AD.

PAUL W. SOWAN.

NATIONAL REGISTER OF BASEMENTS, TUNNELS, UNDERGROUND TRANSPORT FACILITIES AND RURAL CAVES.

A recent newspaper report on the Government's proposals for civil defence (The Guardian, 4th August 1980, p. 20), in addition to mentioning such things as advice to whitewash windows in case of a nuclear war, tells us that 'Finance is also to be made available to draw up a national register of basements, tunnels, underground transport facilities and rural caves which could be designated as public shelters in an emergency.' In Surrey, we had already, previously, had an enquiry from the County Council's Emergency Planning Officer concerning usable underground sites.

PAUL W. SOWAN (20/8/80)

Editor: A few months ago The Sunday Telegraph contacted S. P. Beamon to find out if Subterranea Britannica had such a register. Has anyone else been approached? If not, it is suggested that research groups contact their local authorities and offer assistance.

CHALDON AND MERSTHAM UNDERGROUND STONE QUARRIES, SURREY - PROGRESS TOWARDS SCHEDULING AS ANCIENT MONUMENTS

Negotiations have been in train with the Department of the Environment since 1976 in connection with proposals for scheduling certain of the underground stone quarries of Chaldon and Merstham and adjacent parishes, as Ancient Monuments. These quarries, many of them still accessible, date back to Medieval, if not middle-late Saxon times, and appear to have been undisturbed (post-1967 exploration apart) since about the 18th Century. The intention is to safeguard (a) the vitally important quarry entrance areas, where there is likely to be a high archaeological potential both inside and outside the quarries; (b) access underground; and (c) the underground workings.

A visit by an Inspector from the DoE elicited the comment that, were the quarries to be scheduled as a whole, from Quarry Dean at Merstham through to Quarry Hangers in Chaldon (now Blechingley), we would have in Surrey the second largest Ancient Monument after Hadrian's Wall ! Was this a polite way of saying 'no chance' ?

However, the DoE has now written to suggest further work on the project, with a view to putting forward proposals to the Scheduling Section. Numerous problems remain to be overcome, including (a) ascertaining ownership of mineral rights; (b) preparing a plan of the underground workings; (c) preparing a plan of the surface land around the entrances where surface works and operations may have been. The intention, to start with, is to concentrate on entrances 24 - 28 in Sowan's Schedule (i.e. those around the Rockshaw Road - Hilltop Lane - Springbottom Lane junction.)

PAUL W. SOWAN.

ROAD TUNNELS IN ICELAND AND THE FAROE ISLANDS

Tunnels of any kind are only a recent feature of these north Atlantic island countries. Until the last war, much traffic was by coastal or inter-island shipping; Iceland has had a network of connected, motorable roads only since this was inaugurated in connection with the British and American occupation, to link together encampments, bases and air-strips. Only in the last few years has the country's ring-road been completed by the bridging of the immense glacial Skeidara river on the south coast. Before the war, such island traffic as there was, was by horse only. Neither country, for obvious reasons of geography and tiny populations, has ever had any canals or railways.

Seeking to connect up the several isolated stretches of roads in some of the fiord areas of the Icelandic coastline, to provide safer and more reliable inland communications than offered by coastal shipping, led to the construction of Iceland's first road tunnel, in the north-west fiords, in 1948. This is at Arnarnes, a steep promontory between Skútulsfjörður and Álftfjörður, and is some 35 km. long unlined, through Tertiary basalt lava flows. It allowed a road connection to be made between the region's main town, Ísafjörður, and the fishing village Sudavík, which has a few as 200 inhabitants, most of whom are employed, if not fishing, in the quick-freezing or shrimp processing factories. The need for such a road connection for general traffic was underlined by the loss of a British trawler in severe winter weather some years ago.

Only one further road tunnel has been made in Iceland, in 1967 at Strákar, a 676 m. mountain dropping sheer into the sea. This is concrete lined, again through Tertiary basalt, and 800 m. long. Strákagöngin ('the Strákar tunnel') carries the main coast road from the south via the east side of Skagafjörður to the important small town Síglufjörður (about 2,200 people) in the fiord of the same name. Before the tunnel was made, road vehicles could enter Síglufjörður only by taking the road over the Síglufjardarskard mountain pass, 630 m. above sea-level, and passable only for four or five months in each year.

Generally, in Iceland, the mountain-pass road, with all its problems in autumn, winter and spring, has been resorted to rather than tunnelling for linking up isolated fiord settlements. The fact that this is still a geologically highly active country may have something to do with this. Although the two tunnels are made through the older Tertiary lavas, rather than in the central 'neovolcanic' currently active zone, the whole country is subject to frequent though usually not severe earthquakes. One centred on Dalvík about 1934 did considerable damage to buildings some 30 km. south-east of Strákar.

Road Tunnels in Iceland and the Faroe Island (Cont'd)

Although the Faroe islands archipelago is considerably smaller than Iceland, and has, at about 50,000, approximately a quarter of the population, they are built up of Tertiary basalt lavas and other volcanic rocks far removed from current seismic or volcanic activity. Their scenery much resembles the fiord and mountain landscapes of north-west, mid-north and eastern Iceland. Being an archipelago, with about 16 of the 18 islands inhabited, it is unable to dispense with its network of ferry boat services (Iceland has only three or four fiord ferry services still operating, and no coastwise passenger service any longer). Nor, unlike Iceland, can the Faroe islands rely on internal air services - distances are too short and the only feasible site for an airport, on Vagar, handles international traffic (Iceland-Faroe-Scotland and Norway).

However, in spite of all the difficulties the Faroese are extending their several isolated pieces of a road system and connecting them up as far as possible. The two largest island, Streymoy and Eysturoy, formerly had isolated lengths of road at opposite ends or on opposite sides of their mountainous centres. These are now connected - and on Eysturoy the connection is effected by means of a road tunnel made in the last five years or so between Funningsfjørður and Nordskáli. Eysturoy and Streymoy, being separated only by the very narrow Sundini channel, have, too, been linked with each other by a bridge at the narrowest part, where the distance from island to island is about 200 m.

The same has been done at the narrow Hvannasund between the northern islands Bordoy and Vidoy, which are now linked by a bridge or causeway from the tiny village Norddepil on the former island to Hvannasund village on the latter. Bordoy, too, has one of the earlier and more ambitious Faroese road tunnels. The large (by Faroese standards) town of Klaksvik on the south-west of the island now has a road link through a tunnel under the Áarskard pass between Ánir and Arnafjørður - about 1.7 km. long, unlined. This is a dramatic experience for the northbound traveller from Klaksvik as on emerging from the Áarskard tunnel one has the choice of either turning right into Arnafjørður or plunging directly into a second tunnel, this time of about 2.2 km., also unlined, which passes below another high mountain pass, Seyringaskard, to emerge at Nordtoftir on the east coast of the island. This pair of tunnels took three years to make, and was opened in 1967.

There are two further impressive road tunnels made in the 1950's or 1960's on the important, large, southernmost island Suduroy. Again, as with the other Faroese tunnels, these run below mountain passes or ridges - whereas those in Iceland simply take coast roads through areas where the ground is too steep for a ledge to be cut to carry a road. Each of the Suduroy tunnels is about 1.5 km. long. The northern one carries a road connection to Sandvik, and the southern continues the same road via Hvalba and below the Nakkur-Tempilsklettur ridge to emerge near the important 'towns' Trøngisvágur and Tvøroyri. Interestingly, Tertiary coal was formerly worked from narrow seams in a sequence of sedimentary rocks sandwiched between the lower and upper Tertiary basalt lava series in these mountains, although the small drift mines are now almost or entirely abandoned and it seems unlikely that the road tunnelling, on a far more ambitious scale, drew on any local mining expertise.

With some 300 km. of roads, something like nine of them in tunnel, in a mountainous archipelago, the 50,000 Faroe islanders' economy has problems !

PAUL W. SOWAN.

EAST SURREY WEEKEND 26th - 28th June, 1981: Many thanks are due to all those who contributed to this splendid activity and a full report will appear in the next Bulletin.

THE CATACOMBS OF ROME

Plainly far more could be said of the catacombs than is included in this short introduction which was given at the Winter Conference.

Catacombs are underground cemeteries. The Concise Oxford Dictionary suggests a possible origin of Cata-kumbas (Greek) meaning 'at the boats' and that this may have been a place name or inn associated with cemeteries. In fact all uses of the name 'catacomb' are derived from the Hill of Catacomba to the west of Rome, and the derivation of this name is still something of a mystery.

This area is totally undermined and large areas of otherwise desirable land in the western outskirts of the city are not built upon, either because the ground is consecrated or for fear of subsidence. I have not been able to find a comprehensive map of all the catacombs, nor been able to establish whether they are all inter-connected, but five are open to the public and are on the regular tourist routes. (The partial map, reproduced here, shows that at least some of the entrances inter-connect and give some idea of the size and extent we are talking about.)

The subsoil here is a very hard sandstone and it seems likely that the tunnels were originally dug as a source of building stone and were later adapted as cemeteries. The passages are approximately 8 ft. (2.438 m.) and 20 ft. (6.098 m.) high and are on several levels. Innumerable 'chapels' have been added and tiers of thousands of burial niches cut in the walls. The bodies were interred in the niches and the wall face then made good with bricks and stones set in mortar. In the sections open to the public all the bodies have been removed and only empty niches are visible.

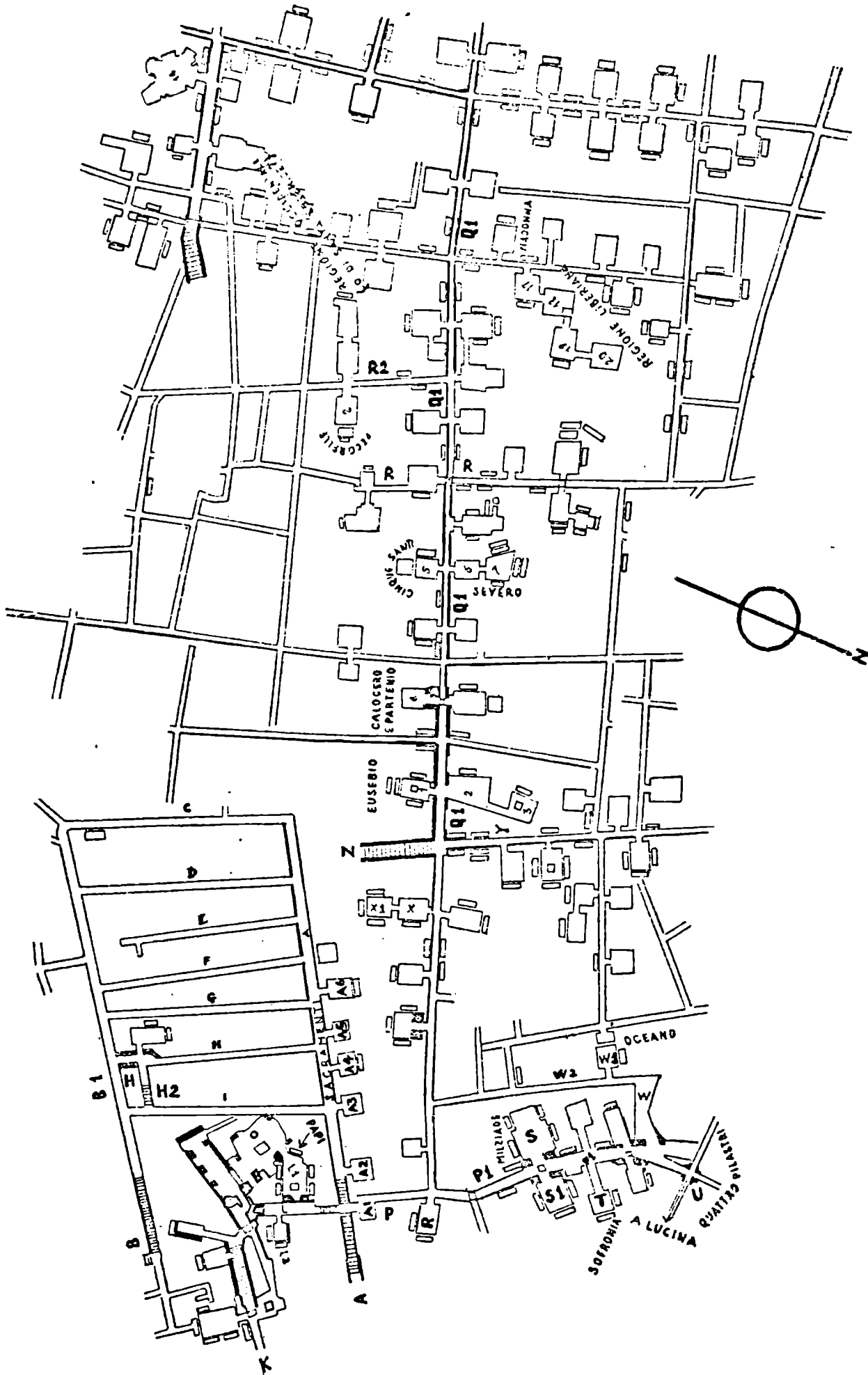
Among the cemeteries known to exist are:-

- The Cemetery of Saint Soteris to the right of the Appian Way.
- The Cemetery of St. Callixtus, also on the right.
- The Cemetery of Pretextatus on the left at the junction of the Appian Way and Appia Pignatelli.
- The Cemetery of St. Sebastian (under the eponymous hill).
- The Hypogeum of the Hunters by 102, Via Appia Antica.
- The Hypogeum of the Sincretisti or Vibia, 101, Via Appia Antica.
- Catacomb of the Holy Cross, 109, Via Appia Antica.
- Cemetery of the Randanini Vineyard, 129, Via Appia Antica.

The Crypt of the Popes ("PAPI" on the plan) was rediscovered on the 15th May, 1854. It contained the remains of nine Popes from the 3rd Century A.D. and three Bishops. This was clearly an important find since, apart from St. Peter, none of the burial places of the Popes had been located until this time. The tombs found ranged from St. Pontian, a Roman, who was elected on 21st July, 230 A.D. and died a martyr five years later, to St. Euthychian of Luni, who was elected on 5th January in the year 275 A.D. The tombs of a further seven Popes between the year 199 to 384 A.D. were also located in this vicinity.

A neighbouring chamber ('O' on the plan) is the Crypt of St. Cecilia. Her body was removed from the Crypt in 821 A.D. by Pope Paschal I and reburied in a basilica. The coffin was opened by command of Clement VIII (1592-1605) and was then observed by Maderno, who made a sculpture of the remains. A copy of this is now in the Crypt and it is plain from this that she was martyred by having her throat cut.

The catacombs are remarkable for their murals, pictures with Biblical themes, inscriptions poetry, memorials, and other works of art, many of which can



still be seen in near perfect condition. Anyone wishing to pursue the matter further could usefully seek out a series of publications called Roma Sotterranea.

HARRY PEARMAN

Chelsea Speleological Society

REFERENCE

STEVENSON, J. The Catacombs, Rediscovered Monuments of early Christianity
(ISBN 0 500 02091 4) Thames & Hudson, London, 1978.

(This book has quite an extensive Bibliography at the back. Ed.)

BOOK REVIEW

PENNICK, N. The Subterranean Kingdom - A Survey of Man-made Structures Beneath the Earth. Wellingborough. Turnstone Press. 160 pp. Illus. line drawings by the author. £4.50 p. (ISBN 0 85500 140 2) 1981.

This book was originally going to be entitled Sacred Geomancy but was altered during preparation. It will now probably be more generally acceptable since presumably there are fewer references to geomancy and more practical interpretations of the material used. The author discusses tunnelling and mining, subterranea in classical antiquity, the religious uses of subterranea such as secret places for initiation and rituals, also hermitages and crypts; prisons, refuges, shelters, storage, cellars, ice-houses; tunnels of legends with possible geomantic association; fogous, earth-houses and deneholes etc.

Well, what can I say about this book except it is most readable, not surprising really when you consider that it deals with a whole series of topics which have been discussed by a number of authors' articles which have appeared in Subterranea Britannica, for example: Jacqueline Close Chalk Mine, Bury St. Edmunds (H. Pearman, Bull. 5, pp.4-7); Carn Euny Fogou (P. Christie, Bull. 12, pp. 11-12, Bull. 1, pp.7-8; Sylvia Harris, Bull. 10, pp. 11-13); Warwick Well (H. Mytum, Bull. 4, p.8); Kinver Edge, Wolverley and Austin Rock, (D. Baker, Bull. 3 pp. 9-10); Nottingham (A. MacCormick, Bull. 2, pp. 9-10, Bull. 4, pp. 2-3; M. Mahony, Bull. 8, pp. 10-11); Tong Castle/Shropshire (Alan Wharton and Ironbridge Museum Trust, Bull. 10, pp. 9-11 and Bull. 11, pp. 4-10); York Sewer (H. Gandy, Bull. 6, pp. 7-9); Anstey legend (S. Beamon Bull. 3, pp. 10-12 and Bull. 4, pp. 4-6); Lime-house dwellings in Burton (F. Morgan, Bull. 6, pp. 3-6 and Bull. 8, pp. 5-9); Ice-houses (S. Beamon, Bull. 5, pp. 8-12); Westerham Mines (Rod le Gear, Bull. 7, pp. 2-4); information from Prof. R. Mauny's article 'The World of Souterrains' (Bull. 7, pp. 13-15) etc.

Several of the illustrations are almost identical with those which illustrated articles in Subterranea Britannica, viz: Brandon flint mine (S. de Lotbiniere Bull. 11, p.14); Warwick Well (H. Mytum, Bull. 4, p.8); Chalk mine survey under Jacqueline Close (H. Pearman, Bull. 5, p.6); Votive figure from Chatre sur Cher (Abbe P. Nollent, Bull. 7, p.15). Two other drawings have been redrawn from the Cambridge Symposium (1978) handouts; Cave yard under Fort Amherst (D. Barnes) and Royston Cave (S. Beamon).

What a pity that from all this information there are only two acknowledgements, however, the Bulletin of Subterranea Britannica does get a mention under Journals Consulted at the end of the book.

At a time when we seem to be losing confidence as a manufacturing and trading nation, it is interesting to reflect that one growth area of the 1970's has been Museums of Work. Industrial Archaeology has not only caught our imagination but has also been given a respectability unheard of in the 1950's and 1960's. Punch, in the year of the Ironbridge bicentenary 1979, went so far as to suggest that by the end of the decade 6,000 Museums of Industrial Archaeology would have replaced 5,000 closed factories.

Interest in Industrial Archaeology has come primarily from individuals and enthusiast groups for our Museums have generally been slow to respond to the new challenge. Local groups, have in many instances, formed Independent Charitable Trusts, whose Museums have been singularly successful in presenting their Industrial Archaeology to a wider audience, and in a way which maintains the established values of preservation and education but also provides what we might call a "Jolly good day out".

Steam Trusts, revived former patterns of passenger transport, specialist Museums of Pottery and Brewing are highly popular, and projects such as Ironbridge and Beamish exist to interpret a range of industrial and community activities within a certain area, and do so in a way which illustrates former industrial and social patterns with maximum effect.

The Coal Industry, however, has not been so fortunate, which is ironic when one considers its role in providing the basic fuel of the Industrial Revolution. The Chatterley Whitfield Mining Museum Trust has been established to redress the balance.

The Concept:

The City of Stoke-on-Trent, is the heart of the North Staffordshire area, and is renowned for its fine china. Pot banks required fuel however, and it is fair to say that during the 19th Century while half the working population were employed producing ware, half were occupied in getting the coal to fire it. It is still difficult to find a family in the Potteries without both mining and ceramic connections.

At a time of some local pit closures therefore, the City Authorities and the National Coal Board (Western Area) considered the possibility of establishing a Museum of the Mining Industry within the Potteries conurbation and began to look for a site and support for such a project.

The initial concept was perhaps modest, a steam winding engine might be preserved and adjacent buildings used for display purposes. A far greater challenge existed however, at Chatterley Whitfield Colliery which was to cease its production life during 1977. Here it might be possible to retain a section of the underground workings and a substantial surface area including a range of colliery buildings which could all be adapted for Museum use.

All "holes in the ground" are rightly subject to the scrutiny of the Mines and Quarries Inspectorate whose standards require an extremely high level of revenue expenditure to maintain. There existed therefore problems, and indeed sceptics who saw that pumping, ventilation, maintenance costs and safety procedures would prove to be beyond the means of the Trust which was about to be established.

Support for the project was sought from other sectors, primarily the Mining Unions and the County Authorities and a Company, limited by guarantee, with no share capital, was formed. Registration as a Charitable Trust necessarily

Chatterley Whitfield Mining Museum Trust (Cont'd)

took more time. Through the agency of the City Council, the Department of the Environment expressed interest in the scheme and the Trust subsequently secured initial funding for the restoration of certain buildings essential for the Museum to open. The site itself is adjacent to an ambitious land reclamation scheme, controlled by the City of Stoke-on-Trent, and as a result of this further funds have been committed from the Department of the Environment who view the Museum development as an integral part of the area's derelict land improvement.

A Brief History:

It is not clear when coal was first mined systematically at Whitfield, but it is reputed that the monks of Eulton Abbey came to the "footrails", (shallow outcrop workings) at nearby Ridgeway for coal during the 14th Century and 15th Century. Shaw's famous History of the Potteries tells us that in 1750 Ralph Leigh of Burslem travelled to Whitfield twice each day for coal. Each of his six horses carried between 2 and 3 cwt. (101.600 - 152.400 kilos.) of coal along lanes which were then impassable to wagons, and for this he received one shilling per day. At this time such draughts of coal were valued at about 7d. (predecimalisation coinage)

Eight different seams of coal outcrop within a mile of the Mining Museum, and as the footrail workings became exhausted shafts were sunk to work the seams at deeper levels. In a survey conducted during 1838, the proprietors of the Whitfield Colliery were listed as representatives of the late William Harrison; buildings and coal stacks were collectively assessed at a value of £154.7s.6d. At this time there was an engine house, shaft, carpenters shop, and brickworks on the site.

During the 1850's a prominent local businessman, Hugh Henshall Williamson, was working a number of coal seams at Whitfield. The Cockshead and 7 ft. (2.133 m.) Bambury seam were worked from footrails, the Hardmine and Holly Lane seams from the Prince Albert shafts and the Bowling Alley and Ten Feet (3.048 m.) seams from the shallower Laura shaft. In the 1860's three more shafts, the Bellringer, the Ten Feet and the Engine Pit were sunk to depths of between 150 ft. (45.720 m.) and 300 ft. (91.440 m.) and were served by one winding engine. Coal was simply hauled up in open tubs which were also used to lower men to their work, cages not being introduced until about 1872.

The North Staffordshire Railway Company opened it's Biddulph Valley line in 1860, and this passed within half a mile of the Whitfield Colliery, whose proprietor constructed a short link connecting his workings with the main line. Full wagons were lowered by 'brake' to the sidings while horses hauled back the empties. By 1863, the shafts were beginning to strike deeper and deeper seams, consequently effective ventilation became a major problem especially in areas where the coal released quantities of explosive methane gas. At this time, it should be remembered, candles were still used as a means of illumination.

By 1865, a group of Tunstall gentlemen had formed the Whitfield Colliery Company Limited, whose capital was intended to be £25,000. The name Chatterley Whitfield followed the purchase of Whitfield by the Chatterley Coal and Iron Company, who sought further supplies of coking coals for their blast furnaces in the Chatterley Valley some five miles (8.047 km.) distant. A direct rail link was planned, and opened with the completion of a quarter mile (402 m.) in length tunnel in 1876. Many other improvements were effected on the site but in 1878 the company was forced to declare itself in a state of voluntary liquidation due to its over ambitious expansion.

Fatal accidents figure large in the history of most collieries and Chatterley Whitfield is no exception for during the early hours of 12th January, 1881, a

Chatterley Whitfield Mining Museum Trust (Cont'd)

terrible explosion occurred in the newly opened out workings of the Cockshead seam. Over twenty men and boys were killed and the Manager subsequently faced a charge of manslaughter at the Stafford Assizes.

By the turn of the century annual coal production at Chatterley Whitfield was almost one million tons (1,015,000 tonnes) and the colliery employed over 3,000 men and boys. Rail transport to work was provided for those living in the Tunstall and Burslem areas, in three covered wagons which had formerly belonged to Barnum and Bailey's Circus. Needless to say, these were nicknamed the "monkey vans".

A new shaft was sunk in 1912/1913 and was named the Winstanley after the company's Mining Engineer. It is this shaft, 700 ft. (213.357 m.) deep into the Holly Lane seam which is used to wind visitors underground. Its characteristic brick built headgear has been adopted as the Museum's logo. The deepest shaft, the Hesketh, (640 yards (585.216 m.)) was completed during 1915 and although this is not used as part of the Museum, its magnificent steam winding engines remain and will shortly be open to the public.

Peak production of 1.25 million tons (1,268,750 tonnes) was achieved during 1937 and the colliery played its part in the war effort with extra manpower provided under the scheme introduced by Aneurin Bevan. After vesting date in 1947, Chatterley Whitfield became part of the National Coal Board who today produce 99% of coal in the United Kingdom. Coal extraction ceased in 1976 when it became more economic to work remaining reserves from nearby Wolstanton Colliery.

Preparations:

The National Coal Board retain certain areas of the Chatterley Whitfield site for laboratory, storage and workshop use. Eighteen acres (7.28 hectares approx.) however, including all buildings of historic interest and their contents, have been passed to the Local Authority, who in turn lease them for a nominal sum to the Mining Museum Trust.

There is a transitional phase in the closure of any production pit, and the National Coal Board took this opportunity to make a major contribution to the Museum project in initial underground preparatory work. Keeping a mine dry, and well ventilated are extremely costly items and an immediate priority was to seal off a more easily manageable area of the coal workings within the shaft pillar. This comprised of unworked coal in which demonstration faces and roadways could be driven. All equipment such as winding engines, signalling and shaft gear, conveyors etc., were left for use by the Trust, but examples of both past and present cutting, and roof support equipment was urgently required. This was secured both through the National Coal Board and from the Independent small mines which continue to operate in certain parts of the county.

With the gradual withdrawal of mining personnel from the site the Museum was faced with an immediate operational problem. Qualified electrical and mechanical engineers, winding engine men, shaftsmen, banksmen, onsetters and deputies are all required to observe statutory maintenance and safety procedures before miners are allowed into a production pit, and the same procedures are rightly applicable to the Museum. To appoint such persons was beyond the means of the Trust and support was therefore sought from the local mining community and in particular from those who have received early retirement or redundancy from the industry. Guides would also be needed to take responsibility for each group of visitors, since the creation of clinically safe conditions underground and conventional self-interpretive displays would obviously be highly inappropriate.

Chatterley Whitfield Mining Museum Trust (Cont'd)

Without the positive response and subsequent support of 40 retired miners, it would be impossible for the Museum to have opened or to operate as it now does. These volunteers, with a lifetime experience within the industry are in addition able to bring it alive for visitors.

Whilst underground preparations were being made, surface work continued through two separate agencies. Firstly, the restoration of two buildings, the Winstanley headgear/airlock and the lamproom received financial backing from the Department of the Environment and the City of Stoke-on-Trent (who undertook to provide the services of its architectural team). Secondly, site clearance, research, publicity and administration was sponsored through the Manpower Services Commission S.T.E.P. Scheme. As a result, by the end of May 1979, we were in a position to open to the public offering a conducted underground tour lasting 1½ hours, an exhibition of local mining and geology, a light refreshment service in the colliery canteen and a small Museum shop for books, pamphlets and postcards etc.

Open to the Public:

A major ceremony was seen to be inappropriate since only a relatively small part of the site was immediately available. Reaction from the public was at first spasmodic, but assisted by some major articles in the press and television coverage, visitor figures grew. In the first fifteen months of operation the Museum received almost 50,000 visitors, 45% of which were organised educational groups. In fact during the middle of a school term, we can find ourselves with more visitors than can be handled comfortably.

The capacity of the cage is ten persons and it is inadvisable to have more than 70 visitors underground at any one time. The daily 'ceiling' therefore stands at about 450 persons, but the public invariably do not arrive in ideal groups at ten minute intervals and a short wait is sometimes necessary.

All visitors are equipped with protective helmets, cap lamps, batteries, self rescuers and riding checks, while contraband, such as tobacco, matches, lighters and even digital watches (possibility of a spark) are taken from them as a safety precaution. The 700 ft. (213.357 m.) descent takes about 1 minute in a cage which affords only minimal headroom. During the underground tour itself, visitors have explained to them the techniques of mining coal from earliest hand work through to the modern shearer loaders and armoured face conveyors of today. Also on display are haulage engines, a jog wheel, stage loader and pit pony stables. It is difficult here to describe the general atmosphere of the tour but without doubt, the cracked timbers and twisted girders in some roadways, and the generally constricted nature of underground work leave a lasting impression in the mind.

We do not provide overalls, or for that matter, pit head baths, but advise our visitors to wear sensible shoes and serviceable clothing. It is not necessary to get dirty (though some choose to), since the absence of working cutting machinery means that the air is not laden with dust as it might be in a production pit. To date we have had visitors from most European countries, America, Canada, Australia and the Far East. There has, in addition, been one delegation of Russian engineers visiting this country to see something of our Mining Industry.

The Future:

The objective of the Chatterley Whitfield Mining Museum Trust, is to provide a complete and vivid picture of the Coal Mining Industry. The underground section has been singularly successful in this respect, but is unable to take the story far enough. It is essential to explore every aspect of the

industry's development, and to show the part that coal will play in answering our future energy demands.

To achieve this a capital appeal has been launched to raise funds for the restoration of all buildings and for their adoption to Museum use. While the opportunity for an underground visit will remain a central feature of the Museum, further facilities on the surface will allow displays of engines, photographs and archival material. Other aspects of mining life, such as the development of communities and the trade union movement will also be explored.

Whilst the project is at present feeling the effects of the current recession, it is highly appropriate that it has been established at a time when coal is re-asserting itself as a vital energy source. (See also page 19 photos).

JONATHAN A. BRYANT

Chatterley Whitfield Mining Museum Trust,
Chatterley Whitfield Colliery,
Tunstall, Stoke-on-Trent. ST6 8UN.
(Tel: 0782 813337/8)

OPENING TIMES:

Tuesday to Friday 9.30 - 4.30.
Weekends and Bank Holidays 10.00 - 5.00.
Last trip underground leaves at 3.30 approximately.
Closed on Mondays except Bank Holidays.

(Phil Marshall has already visited this Museum and can highly recommend a visit.)

SOME RECENT MINING HISTORY BOOKS

- CRADDOCK, P.T., Edr. Scientific Studies in Early Mining and Extracting Metallurgy. British Museum Occasional Paper 20, 173 pp., illus. £6.00 (ISBN 0 86159 019 8) 1980.
- HEALY, J. F. Mining and Metallurgy in the Greek and Roman World. London. Thames & Hudson, 316 pp., illus. £11.00 (ISBN 0 500 40035 0) 1978.
- SHEPHERD, R. Prehistoric Mining and Allied Industries. London. Academic Press, xii + 272 pp., illus. £16.00. (ISBN 0 12 639480 6) 1980.

Apart from flint, silex and obsidian, dealt with extensively by Shepherd, all three of these books are largely devoted to metalliferous mining. Healy (like Oliver¹ before him) has nothing to say on underground stone quarrying, which almost certainly was carried on by the Greeks and Romans and remains a sadly neglected area for study. Craddock's compilation contains contributions by a number of authors on metalliferous mines, again, from the Bronze Age onwards, in Ireland, Spain, the Aegean, Sinai, Sardinia and Israel. Shepherd's book will probably be of most interest to Subterranea Britannica members, containing as it does a most useful review of all known British and western European flint-mining sites, and of the scattered literature relating to them. There are also chapters on obsidian and other hard stones; copper and Bronze Age mining; and iron. Two useful appendices are devoted to a summary of the sites considered, and methods of dating. There are eight and a half pages of references. Regrettably, the book appears not to have been as carefully proof-read as it might have been, and contains some generally unimportant but irritating errors.

London is situated on a geological feature known as a syncline, a huge dish of the sandwich of geological layers. The rock formations which outcrop at the surface, and which are therefore accessible for excavations, are modern and more or less waterlogged river gravels, impervious London Clay, and, outcropping around the edges of the London area, Thanet Sand, Blackheath Pebbles, Woolwich and Reading Clay, Claygate Beds, Chalk etc. Of these, only parts of the Chalk and Thanet Sand, if above the local water table, were readily excavatable before pumping and drainage techniques were perfected.

Because both clay and chalk are unsuitable for cave formation there are no known natural caves in the London region.

Jack Cades Cavern at Blackheath (TQ 38167668): This cavern was credited with being the refuge of the Kentish Rebel of 1450 when it was discovered in 1780, but is indisputably the chalk mine for St. Paul's worked around the turn of the Eighteenth Century. For 70 years it was a popular place of resort and entertainment, but was eventually sealed in 1853 after its reputation became tarnished. Searched for fruitlessly in 1906, and 1914 - 18, however, was finally located in 1939 by a resistivity survey when a shaft was sunk to it in the hope that it would make a good air-raid shelter. Insufficient cover aborted this project, and the entrance is now indistinguishable under a greenhouse. (See also Bulletin No. 1, pp. 9 & 10).

Thames Tunnel (TQ 34557990) 1825 - 43: The first modern subaqueous tunnel, from Wapping to Rotherhythe. The awesome cost of its making in men, time, and money showed it to be a technology beyond the then known limits; an intuitively recognised symbol of the growing technological power of Britain. It is difficult to convey its impact except by comparison with the American space programme - the summit of a nation's technology being felt to represent the nation itself. It attracted more visitors in 1851 than the Great Exhibition, and British Envoys were questioned on it by Tibetan Lamas.

Engineered by Marc Brunel assisted for the first three years by his son Isambard, then abandoned for seven years (and known as the 'Great Bore'), it was completed after eighteen years, £486,000 and at least ten lives, having been breached nearly a dozen times. Marc Brunel died two years later, his health irrevocably broken. A double tunnel with 13 ft. (3.962 m.) cover, in brickwork, each half horseshoe shaped and with external dimensions of 22 ft. 3" (6.781 m.) by 37 ft. 6 ins. (11.430 m.), it employed the first tunnelling shield, patented by Brunel. A financial disaster, it was sold to the East London Railway in 1866, and is now part of the London Transport system.

Main Drainage 1864 - 75: The initial rivers of London, rising on Hampstead Heath and the Sydenham ridge, were progressively canalised and culverted, as their condition became unacceptable, until they ran merely as sewers. They discharged their raw contents straight into the Thames, which had deteriorated in its turn to an unacceptable condition by the 'Great Stink' of 1858. In addition the successive cholera epidemics, claiming 80,000 deaths, induced a reforming public health movement led by Edwin Chadwick which culminated in the Metropolitan Board of Works and the construction of the great east-west intercepting sewers by its engineer Bazalgette. At one brilliant stroke he solved the problem by intersecting the original sewers and carrying their contents parallel to the river in very large sewers at three levels to discharge well downstream of London. A hundred miles (160.934 km.) at 10 ft. (3.048 m.) in diameter, with all the attendant mechanics of pumping stations, complex diverting junctions, and outfall works, were ruthlessly driven, sometimes at great depths, in a space of eleven years. Together with the banning of extraction from the tidal Thames, and drinking water filtration, the Cholera deaths dropped by ninety percent.

Selected Underground Structures in London (Cont'd)

Tower Subway (TQ 33488060 to TQ 33488020) 1869: From Tower Hill to Hays Wharf, it set the pattern for all subsequent cohesive ground tunnels. Engineered by Barlow and constructed by his pupil Greathead, after no contractor could be found to risk another Thames Tunnel, it employed for the first time segmental cast-iron lining and a circular tunnelling shield, as used in all similar applications since. Initially designed for a cable-hauled tram, it relapsed into a foot tunnel and closed on the opening of Tower Bridge in 1894. Entrance kiosks still exist, and the 7 ft. (2.133 m.) in diameter tunnel now carries water mains.

Pneumatic Railways 1860's: This principle, whereby a whole train is sucked or blown through a tunnel, was promoted and pioneered by the engineer Thomas Webster Rammel. He constructed a 4 ft. (1.930 m.) in diameter parcel carrying version, the Pneumatic Despatch, from Euston (TQ 29558270) to St. Martins le Grand (TQ 32188130); a standard gauge passenger carrying version, the Crystal Palace Pneumatic Railway, in Crystal Palace Park (TQ 34807090); and commenced construction of a sub-Thames immersed tube, the Whitehall and Waterloo Railway, which was abandoned after the financial collapse of 1866. Only the Pneumatic Despatch still indisputably exists beneath High Holborn and Tottenham Court Road, and is used for telecommunications cables.

King William Street (TQ 32908080) 1890: The first full size tube railway, the City and South London, was constructed by Greathead, using the techniques he pioneered on the Tower Subway, from Stockwell to a terminus at the Monument beneath King William Street. When subsequently extended the alignment was unsuitable and a new sub-river tunnel parallelling the old one was constructed. The dead end thus created was used as a siding and then abandoned, along with the station. During World War II the portions not under the river were used as deep air-raid shelters, that under Borough High Street being the largest in London, and though now empty this remains their condition.

Snow Hill Station and Tunnel (TQ 31608170) 1866: The Metropolitan Railway, constructed on a cut-and-cover principle, was opened from Paddington to Farringdon in 1863 and extended to Moorgate in 1865. It connected at Kings Cross with the main-line Great Northern Railway. The London, Chatham and Dover Railway from the south had reached Ludgate Hill by 1865, and the possibility therefore existed of a north-south main-line connection. As part of the Widened Lines doubling of the track of the Metropolitan from Kings Cross to Moorgate a spur, the Metropolitan Extension Railway, was constructed in 1866 joining Farringdon to Ludgate Hill. Subsequently, in 1868, the Midland Railway at St. Pancras and the Great Northern at Kings Cross were joined to the Widened Lines, and the north-south link was complete. Extensive underground goods yards were constructed beneath Smithfield Market and two new stations were opened at Holborn Viaduct (Low Level) and Snow Hill, the latter actually in the Extension Railway tunnel. The link was closed to passengers in 1916 and to goods in 1972, though the goods yards still exist as car parks, and Snow Hill station lies abandoned in the foundations of a modern office block.

Subways 1860 onwards: The London subway system is unique in its size and extent - a total of nine miles (14.484 km.) of subterranean streets. The concept was initiated as early as 1868 with the development by the Adam brothers of the Adelphi housing (TQ 30358065), each of the four streets is parallellled below by a subterranean service road. With the blossoming of private gas and water companies, operating low quality service pipes in cut throat competition, street works became an intolerable nuisance; as many as three different companies might have mains in a street, each needing constant repair and being sabotaged by the other two. In the 1840's and 50's an insistent lobby by John 'Subway' Williams and William Austin of the Commissioners for Metropolitan Improvements led to its successor, the Metropolitan Board

Selected Underground Structures in London (Cont'd)

of Works, holding an open competition for the best idea to obviate the nuisance. The winning scheme, for a subway large enough to walk down and accommodating all the service pipes beneath the centre of the road, was built in the driving of a new street now known as Cranbourne Street in 1860. Thereafter every Metropolitan Street Improvement incorporated a central subway, accessed at intervals by large manholes or gratings for ventilation.

The City (as distinct from the Metropolis) was not slow to follow, and the most complex and extensive subway systems are those associated with the Holborn Valley improvements of 1863 by Hayward culminating in Holborn Viaduct (TQ 31508158) and the Victoria Embankment/Queen Victoria Street (TQ 30307965 to TQ 32608114). Though the GLC (as successor to the Metropolitan Board of Works) has powers to compel services to be laid in the subways they have never been liked by the Statutory Undertakers, especially since a catastrophic gas explosion in the Pneumatic Despatch tube in High Holborn in 1928.

Kingsway Tram Tunnel (TQ 30608138) 1906: Conceived as a link between the northern and southern tram systems during the planning of the Kingsway street improvement. Partly in double segmental cast iron tubes 14 ft. 5 ins. (4.394 m.) in diameter, and partly rectangular cut and cover, with two subterranean stations at Holborn and Aldwych, it was opened initially from Theobalds Road to Aldwych and later extended to the Embankment in 1908. Expensive works were necessary in 1929 to increase the headroom to 16 ft. 6 ins. (5.029 m.) to accommodate double-decker trams, and in 1937 when the reconstruction of Waterloo Bridge necessitated the repositioning of the southern entrance. With the phasing out of the trams in the 1950's it was considered for car parking or as a traffic underpass but after the last tram in 1952 it was used for storage. In 1964 its southern half was converted to a vehicular tunnel under the Strand, one of the ramps destroying Aldwych station. The northern section, including Holborn station now houses a GLC emergency control centre.

Post Office Railway 1915 - 1927: The Post Office operates its own narrow gauge tube railway from Paddington (TQ 26708140) to the Eastern District Office (TQ 34908180). Initially proposed as the first stage of a larger system, and engineered by Dalrymple Hay, it was built from 1915 - 17, abandoned until 1924 and finally completed in 1927. Twin 2 ft. (0.609 m.) gauge lines are contained in a 9 ft. 6 ins. (2.895 m.) tunnel which splits at stations into two 25 ft. (7.620 m.) tunnels; remote control electric trains, working on 440 volts direct current and the four rail system, traverse the 6½ miles (10.461 km.) in 20 minutes at 5 minute intervals, picking up and setting down mailbags at the six intermediate stations. These are at the Western Parcels Office, Barret Street (closed); Western District Office, Wimpole Street; West Central District Office, New Oxford Street; Main London Letter and Parcel Office, Mount Pleasant; Foreign Sorting Office, St. Martin le Grand and Liverpool Street Station. Average depth is 70 ft. (21.336 m.), varying between 90 ft. (27.429 m.) (Regent Street) and 54 ft. (17.170 m.) (Mount Pleasant).

Deep Shelters 1940-2: Linked to eight deep tube stations at Belsize Park, Camden Town, Goodge Street, Chancery Lane, Stockwell, Clapham North, Clapham Common and Clapham South there are deeper tube tunnel shelters constructed in response to the 1940 Blitz and in expectation of Germany developing the atom bomb. Each consists of twin 16 ft. 6 ins. (5.029 m.) tunnels, 80-105 ft. (32.435 m.) and 1400 ft. (426.110 m.) long divided by a floor on the diameter and equipped with 8,000 bunks. Cross tunnels connect to two double helix stair shafts protected by pill boxes on the surface, the tube station, and toilet, canteen and first aid facilities. Ventilation plant could deal with a gas attack, and alternative electricity supplies were provided.

By the time construction was completed the tide of war was turning and the Blitz no longer a threat, so they were put onto standby and used for a variety of government purposes, that at Goodge Street being used as a Headquarters

Selected Underground Structures in London (Cont'd)

for Eisenhower for instance. During the V1 and V2 assault of 1944 five were finally opened for public shelter, though highest recorded population was only 12,000.

Subsequent use as temporary hostels and billets was suspended after an uncontrollable fire at Goodge Street in 1956 had to be left to burn out. Chancery Lane was converted in the early 1950's into a five hundred line trunk telephone exchange with a six weeks food supply and its own artesian well, connected to the 12 miles (19.312 km.) of 7 ft. (2.133 m.) in diameter deep tube cable tunnels constructed since the war by the Post Office. Camden Town has been used as a set for 'Dr. Who' and 'Blake 7', whilst Belsize Park is leased as a security archive.

Cabinet War Rooms and Paddock 1939 (TQ 29957975 and TQ 22288630): After the ruthless bombing of Guernica in 1937 demonstrated for the first time the full destructive force of modern air attack, steps were taken to ensure the functioning of the government under such bombardment by the provision of protected accommodation. The War Cabinet were located in a secretly excavated deep basement beneath the then Ministry of Works (now the Central Statistical Office) at Storey's Gate, St. James Park.

The semi-basement level was filled solid with concrete, reinforced with tram lines, and earth excavated from below the sub-basement in forming the lower level. In addition to the actual Cabinet Room there are conference rooms for all the Chiefs of Staff, map rooms, bedrooms and a canteen. From his study Churchill broadcast many of his speeches 'from number ten Downing Street', and from his private toilet cubicle to which he would retire for hours at a time to the consternation of his staff) he would talk to Roosevelt on the 'Hot Line', and to the listening Germans who had broken the scrambling system used. The Cabinet War Rooms are open to the public by appointment.

Fearful that their protection would prove inadequate a secondary headquarters, known as the 'Paddock' was constructed at the Post Office Research Station, Dollis Hill, consisting of two levels of protected basement separated by 10 ft. (3.048 m.) reinforced concrete floors. Used only once by the Cabinet in a practice, it is now leased.

Eventually a whole series of specially constructed or converted Government buildings were heavily protected, including Curzon Street House where a protected suite was provided for the Royal Family to replace the refuge constructed under the North Terrace at Buckingham Palace. Many were connected by a pedestrian tunnel system down Whitehall and under the Thames at Waterloo.

Down Street and St. Pauls (TQ 28658008 and TQ 32028139): Similar protection was provided for other non-governmental essential services. At the deserted Down Street station on the Piccadilly line (closed since 1932) the platforms and connecting passages were infilled with offices for the Railway Executive Committee (formed to run the rail network during the war), with access from the original staircase, or via a specially stopped train en-route between Hyde Park Corner and Piccadilly. The complex is now derelict. Similarly at St. Pauls, the old lift shafts (abandoned when the escalator was installed) were infilled with a nine storey National Grid Control Centre, the surface features of which were demolished in 1973.

Headquarters Number 11 Group Uxbridge (TQ 06588348): For air defence control purposes Britain's air space was divided into an hierarchical system of Sectors and Groups, each Sector Control directing perhaps three or four airfields and reporting to a Group Control controlling perhaps eight sectors which in turn reported to Fighter Command at Bentley Priory, Stanmore. All these

Selected Underground Structures in London (Cont'd)

Controls were located in protected Bunkers. In 1940 seven radial sectors round London formed 11 Group, covering the whole of southern England south of a line from Great Yarmouth through Baldock and Buckingham to Lymington. Seventy feet (21.336 m.) beneath RAF Uxbridge is the Group bunker, from which the Battle of Britain was directed.

A small surface blockhouse shield the head of a stair which drops to an intermediate landing serving the air conditioning and generating plant, and turning through a right angle reaches the bunker proper containing the two storey control room. In the centre of the room is the plotting table, showing the whole of southern England and Europe overlaid with the Military Grid. Round the edge the WRAC plotting positions are indicated by the telephone headsets and 'croupier's rakes'. Above is a gallery with cantilevered glass windows which contained the Controller and his assistants. The opposite wall is covered by an automatic 'Tote' board, showing the status of each airfield in the Group.

With the amalgamation of Fighter and Bomber Command into Strike Command at High Wycombe Number 11 Group Headquarters transferred to the Bentley Priory bunker, leaving the Uxbridge Control preserved in its Battle of Britain condition. Other Group Headquarters have similarly been re-used, that of 18 Group (Coastal Command) at Northwood, for instance, by NATO Command, Air, Channel.

ROGER MORGAN

London Subterranean Survey Association.

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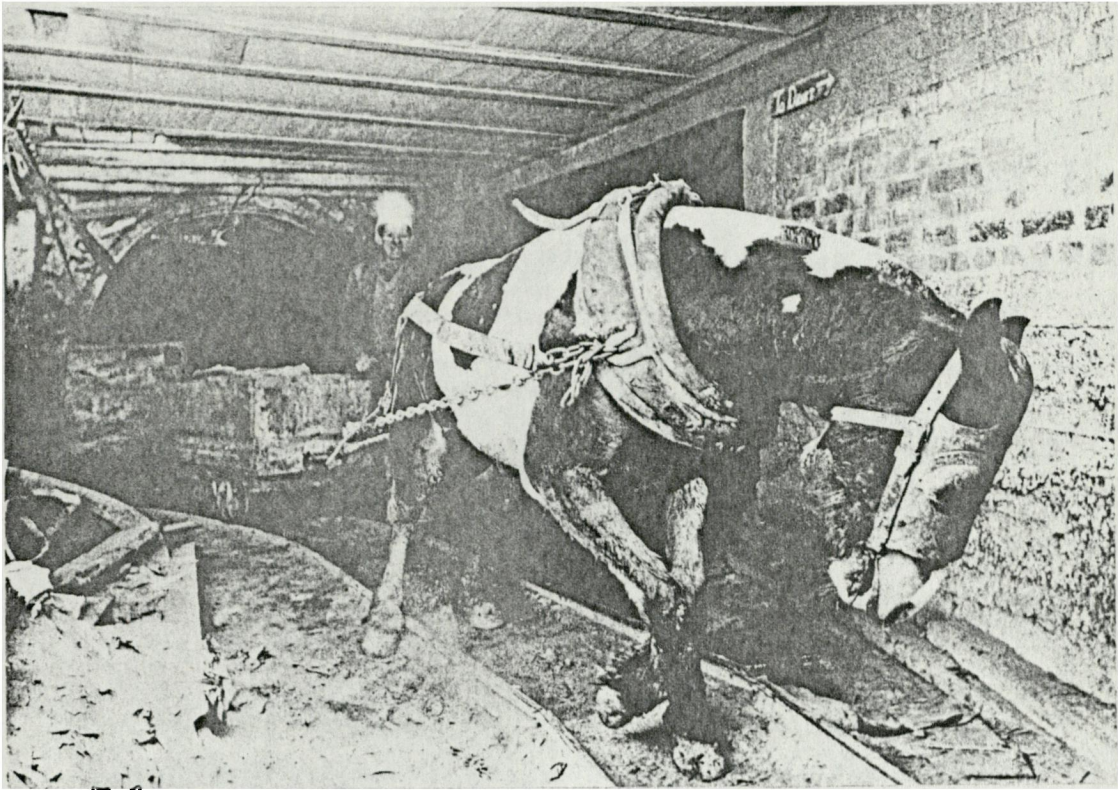
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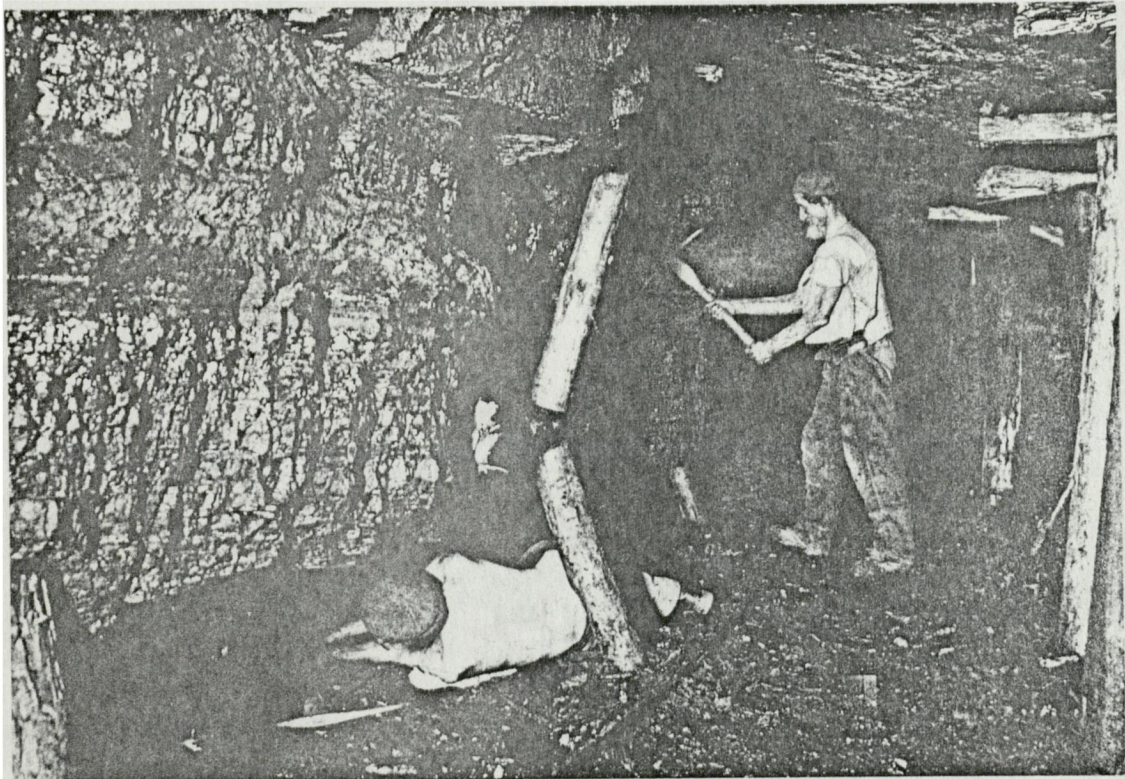
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Other information can also be obtained from the Chelsea Speleological Society's records.

(The London Subterranean Survey Association is a group of architects and engineers interested in promoting the use of underground space, and the accurate recording of all subterranean features in a unified database available to construction specialists. Any information of a subterranean nature is welcomed to be forwarded to: 15A Kensington Court Gardens, Kensington Court Place, London W8 5QF)



Pony at work. Pit ponies ceased to be used at Chatterley Whitfield in 1932.



Hand holing and spragging face. c.1925.

